UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,888	03/29/2004	Tomohiro Satoh	000409-109	1075

21839 7590 04/25/2007
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER	
SCHNEIDER, CRAIG M	
ART UNIT	**PAPER NUMBER**
3753	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/810,888	SATOH, TOMOHIRO	
	Examiner	Art Unit	
	Craig M. Schneider	3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-2 and 4-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2 and 4-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 February 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/7/07 has been entered.

Drawings

2. The drawings were received on 2/7/07. These drawings are acceptable.

Claim Objections

3. Claim 6 is objected to because of the following informalities: In lines 3 and 5 "provided on the valve" should be --provided in the valve--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-2, 4, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sudani et al. (2002/0134443) in view of Schwerin (3,924655).

Sudani et al. disclose a hydraulic pressure control device comprising a cylindrical valve body (31); a line port (35) provided in the valve body and adapted to be supplied with a hydraulic fluid; a supply port (36) provided in the valve body to receive the

hydraulic fluid supplied to the line port; a spool valve (32) disposed in the valve body and slidable along an inner surface of the valve body along an axis; a linear solenoid valve (10) which regulates hydraulic fluid pressure in a first conduit (23), the hydraulic pressure in the first conduit providing force against the spool valve in a first direction along the axis; a feedback conduit (326) fluidly connected to the supply port, hydraulic pressure in the feedback conduit providing a force against the spool valve in a second direction that is opposite to the first direction; the hydraulic pressure in the first conduit and the hydraulic pressure in the feedback conduit together contributing to an overall force on the spool valve that controls the physical relationship between the spool valve and the valve body; at least one land portion (322) provided at the spool valve and slidable along the inner surface of the valve body; and at least one recess (323) provided at an edge of the land portion of the spool valve (page 2, para. 34 and 39 and page 3, para. 41, 44, and 47-51). Sudani et al disclose all the features of the claimed invention except that the hydraulic pressure control device has a recess wherein cross-sectional opening area that opens to the inlet port between the at least one recess and the inner surface of the valve body continuously changes in a sliding direction of the spool valve, the cross-sectional opening area of the recess is formed to have a proportional relationship between flow quantity of a hydraulic fluid and moving distance of the spool valve, the at least one recess having a bottom that is curved so that a depth of the at least one recess toward the edge of the land in a longitudinal direction of the spool valve, and the at least one recess having a width at an outer surface of the spool valve that increases along a curved profile toward the edge of the land in the

longitudinal direction of the spool valve. Schwerin discloses wherein cross-sectional opening area (49 and 54) that opens to the inlet port between the at least one recess and the inner surface of the valve body continuously changes in a sliding direction of the spool valve, the cross-sectional opening area of the recess is formed to have a proportional relationship between flow quantity of a hydraulic fluid and moving distance of the spool valve, the at least one recess having a bottom that is curved so that a depth of the at least one recess toward the edge of the land in a longitudinal direction of the spool valve, and the at least one recess having a width at an outer surface of the spool valve that increases along a curved profile toward the edge of the land in the longitudinal direction of the spool valve (col.3, line 44 to col. 4, line 12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the recesses of Schwerin onto the spool of Sudani et al., in order to control flow of fluid from the passages.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as obvious over Sudani et al in view of Schwerin.

The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product in the prior art, the claim is unpatentable even though the prior product was made by a different process (see MPEP 2113).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudani et al. (2002/0134443) in view of Lee (2,747,612).

Sudani et al. disclose a hydraulic pressure control device comprising a cylindrical valve body (31); a line port (35) provided in the valve body and adapted to be supplied with a line pressure; a supply port (36) provided in the valve body and outputting a controlled pressure which is controlled from the line pressure; a spool valve (32) disposed in the valve body and slidable along an inner surface of the valve body along an axis; a linear solenoid valve (10) which regulates hydraulic fluid pressure in a first conduit (23), the hydraulic pressure in the first conduit providing force against the spool valve in a first direction along the axis; a feedback conduit (326) fluidly connected to the supply port, the hydraulic pressure in the feedback conduit acting on the spool valve and providing a force against the spool valve in a second direction that is opposite to the first direction; the hydraulic pressure in the first conduit and the hydraulic pressure in the feedback conduit together contributing to an overall force on the spool valve that controls the physical relationship between the spool valve and the valve body; and at least one land portion (322) provided at the spool valve and slidable along the inner surface of the valve body (page 2, para. 34 and 39 and page 3, para. 41, 44, and 47-51). Sudani et al disclose all the features of the claimed invention except that the hydraulic pressure control device has at least one recess provided at a wall of the inner surface of the valve body facing the outer surface of the spool valve; wherein cross-sectional opening area that opens to the inlet port between the at least one recess and the outer surface of the spool valve is continuously decreased in a sliding direction of the spool valve from the opening portion, and the cross-sectional opening area is formed to have a proportional relationship between flow quantity of a hydraulic fluid and

moving distance of the spool valve, the at least one recess having a bottom that is curved so that a depth of the at least one recess increases in a longitudinal direction of the valve body, and the at least one recess having a width at an inner surface of the valve body that increases along a curved profile in the longitudinal direction of the valve body. Lee discloses at least one recess (70) provided at a wall of the inner surface of the valve body facing the outer surface of the spool valve; wherein a cross sectional opening area that open to the inlet port between the at least one recess and the outer surface of the spool valve is continuously decreased in a sliding direction of the spool valve from the opening portion and, the cross-sectional opening area is formed to have a proportional relationship between flow quantity of a hydraulic fluid and moving distance of the spool valve, the at least one recess having a bottom that is curved so that a depth of the at least one recess increases in a longitudinal direction of the valve body, and the at least one recess having a width at an inner surface of the valve body that increases along a curved profile in the longitudinal direction of the valve body (col. 7, lines 8-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the recess of Lee onto the wall passageways of Sudani et al., in order to decrease the power actuating means (col. 7, lines 27-33).

8. Claims 1-2, 4, 7, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakahara et al. (5,819,192) in view of Lou (2002/0007857) and Schwerin.

Wakahara et al. disclose a hydraulic pressure control device comprising a friction engagement means including a drive rotor (58c) and a driven rotor (58a), a piston (58e) adapted to push a plurality of clutch discs (58b and 58d) between the drive rotor and a driven rotor and to engage the drive rotor with the driven rotor, a hydraulic pressure chamber (58f) defined by the piston (col. 3, line 40 to col. 4, line 9), a hydraulic pressure control mechanism (40) controlling hydraulic pressure to be supplied to the hydraulic pressure chamber, a cylindrical valve body (40b) provided at the hydraulic pressure control mechanism, a spool valve (40G) disposed in the valve body and slidable along an inner surface of the valve body, at least one land portion provided at the spool valve and slidable along the inner surface of the valve body (col. 10, lines 29-65); a linear solenoid valve (34) which regulates hydraulic fluid pressure in a first conduit (40P1), the hydraulic pressure in the first conduit providing force against the spool valve in a first direction along an axis; and a linear solenoid valve regulating a hydraulic pressure in the first conduit (col. 10, line 66 to col. 11, line 35) . Wakahara et al. does not disclose a feedback conduit fluidly connected to the supply port, the hydraulic pressure in the feedback conduit providing a force against the spool valve in a second direction that is opposite to the first direction; the hydraulic pressure in the first conduit and the hydraulic pressure in the feedback conduit together contributing to an overall force on the spool valve that controls the physical relationship between the spool valve and the valve body; at least one recess provided at an edge of the land portion of the spool valve wherein cross sectional opening area between the recess and the inner surface of the valve body continuously decreased in sliding direction of the spool valve from the edge

portion of the land portion, the at least one recess having a bottom that is curved so that a depth of the at least on recess increases toward the edge of the land in a longitudinal direction of the spool valve, and the at least one recess having a width at an outer surface of the spool valve that increases along a curved profile toward the edge of the land in the longitudinal direction of the spool valve. Lou discloses a feedback conduit (54) fluidly connects to the supply port (34), the hydraulic pressure in the feedback conduit provides a force against the spool valve in a second direction that is opposite to the first direction (page 1, para. 13-18). Schwerin discloses wherein cross-sectional opening area (49 and 54) that opens to the inlet port between the at least one recess and the inner surface of the valve body continuously changes in a sliding direction of the spool valve, the cross-sectional opening area of the recess is formed to have a proportional relationship between flow quantity of a hydraulic fluid and moving distance of the spool valve, the at least one recess having a bottom that is curved so that a depth of the at least one recess toward the edge of the land in a longitudinal direction of the spool valve, and the at least one recess having a width at an outer surface of the spool valve that increases along a curved profile toward the edge of the land in the longitudinal direction of the spool valve (col.3, line 44 to col. 4, line 12).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the feedback conduit of Lou onto the hydraulic pressure control device of Wakahara et al., in order to provide stability to the valve (page 1, para. 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the recesses of Schwerin onto the spool of Wakahara et al., in order to control flow of fluid from the passages.

9. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakahara et al. (5,819,192) in view of Lou (2002/0007857) and further in view of Lee (2,747,612).

Wakahara et al. disclose a hydraulic pressure control device comprising a friction engagement means including a drive rotor (58c) and a driven rotor (58a), a piston (58e) adapted to push a plurality of clutch discs (58b and 58d) between the drive rotor and a driven rotor to engage the drive rotor with the driven rotor, a hydraulic pressure chamber (58f) defined by the piston (col. 3, line 40 to col. 4, line 9), a hydraulic pressure control mechanism (40) controlling hydraulic pressure to be supplied to the hydraulic pressure chamber, a cylindrical valve body (40b) provided at the hydraulic pressure control mechanism, a line port (40A) provided in the valve body and supplied with a hydraulic fluid; a supply port (40B) provided in the valve body and supplying the hydraulic fluid; a spool valve (40G) disposed in the valve body and slidable along an inner surface of the valve body along an axis, a linear solenoid valve (34) which regulates hydraulic fluid pressure in a first conduit (40P1), the hydraulic pressure in the first conduit providing force against the spool valve in a first direction along the axis; at least one land portion provided at the spool valve and slidable along the inner surface of the valve body (col. 10, lines 29-65). Wakahara et al. does not disclose a feedback conduit fluidly connected to the supply port, the hydraulic pressure in the feedback

conduit acting on the spool valve and providing a force against the spool valve in a second direction that is opposite to the first direction; the hydraulic pressure in the first conduit and the hydraulic pressure in the feedback conduit together contributing to an overall force on the spool valve that controls the physical relationship between the spool valve and the valve body; and at least one recess provided at a wall of the inner surface of the valve body facing the outer surface of the spool valve wherein a cross sectional opening area between the at least one recess and the outer surface of the spool valve is continuously decreased in a sliding direction of the spool valve, the at least one recess having a bottom that is curved so that a depth of the at least one recess increases in a longitudinal direction of the valve body, and the at least one recess having a width at an inner surface of the valve body that increases along a curved profile in the longitudinal direction of the valve body. Lou discloses a feedback conduit (54) fluidly connects to the supply port (34), the hydraulic pressure in the feedback conduit provides a force against the spool valve in a second direction that is opposite to the first direction (page 1, para. 13-18). Lee discloses at least one recess (70) provided at a wall of the inner surface of the valve body facing the outer surface of the spool valve; wherein the cross sectional opening area being open to the inlet port between the at least one recess and the inner surface of the valve body continuously changes in a sliding direction of the spool valve, and the cross-sectional opening area of the recess is formed to have a proportional relationship between flow quantity of a hydraulic fluid and moving distance of the spool valve the at least one recess having a bottom that is curved so that a depth of the at least one recess increases in a longitudinal direction of

the valve body, and the at least one recess having a width at an inner surface of the valve body that increases along a curved profile in the longitudinal direction of the valve body (col. 7, lines 8-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the feedback conduit of Lou onto the hydraulic pressure control device of Wakahara et al., in order to provide stability to the valve (page 1, para. 7).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the recess of Lee onto the wall passageways of Wakahara et al. and Lou, in order to decrease the power actuating means (col. 7, lines 27-33).

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sudani et al./Lee as applied to claim 6 above, and further in view of Schwerin.

Sudanit et al./Lee in combination disclose all the features of the claimed invention except that wherein the at least one recess also includes side walls extending away from the bottom of the at least one recess, the side walls being curved.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the grooves on the spool valve of Schwerin onto the walls of the valve housing , since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wakahara et al./Lou/Lee as applied to claim 8 above, and further in view of Schwerin.

Sudanit et al./Lee in combination disclose all the features of the claimed invention except that wherein the at least one recess also includes side walls extending away from the bottom of the at least one recess, the side walls being curved.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the grooves on the spool valve of Schwerin onto the walls of the valve housing, since it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. In re Einstein, 8 USPQ 167.

Response to Arguments

12. Applicant's arguments filed 2/7/07 have been fully considered but they are not persuasive. Applicant argues that the combination of Sudani et al. and Lee do not disclose the invention as claimed in claim 6. The examiner respectfully disagrees with this and would like to point out that only one recess is necessary and Lee satisfies this. This is further evident by claim 10 which further clarifies that a side wall is needed which makes it impossible to have only one recess. The above can also be applied to the arguments for claim 8 in which claim 8 is further defined by claim 12.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Macy (2,340,399), Doerfner (2,702,529), Rosebrook (2,958,340), Tennis (3,534,774), Mercier (3,563,272), Seamone (4,155,535), Hammond et al. (4,615,358), Pfuhl et al. (4,890,647), and Hennessy et al. (4,941,508) disclose multiple recesses in the spool.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig M. Schneider whose telephone number is (571) 272-3607. The examiner can normally be reached on M-F 8:30 -5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Keasel can be reached on (571) 272-4929. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CMS CMS
April 20, 2007

Eric Keasel

ERIC KEASEL
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700